the formation of Vitamin A in the animal depends in large part upon:

(a) The rôle of the unsaturated hydrocarbon carotene and the associated fatty acids found in arachis oil in restoring the fat-iodin balance in animals, fat depleted by Vitamin A deficiency diet.

(b) Its action in restoring the desaturating power of the liver.

From a series of studies with ferrous iodide carried on since 1925 we have come to the conclusion that there are two factors in recovery from Vitamin A deficiency, one, effective in curing *xerophthalmia,* and *otitis media,* and in awakening the dormant thyroid; the other belonging to unsaturated fats and hydrocarbons, aiding to restore the iodin-fat balance and facilitating growth.

As reported at the Cleveland meetings of the American Association for the Advancement of Science (1930) we find that linoleic acid is extremely effective when combined with the ferrous iodide. Studies during the past winter and now in progress indicate that ferrous iodide and linoleic acid will act more favorably on rats, profoundly depleted of Vitamin A, than cod liver oil.

That ferrous iodide alone should prove beneficial in Vitamin A deficiency, accompanied by certain symptoms of thyroid disturbance is probably due to the iodin action on keratinized tissues and the withdrawal of stored fats from the animal. The dormant thyroids of animals that have received a fat-free diet for some time are apparently stimulated by the ferrous iodide, and the addition of unsaturated fats aids in restoring the balance. Further details regarding the experiments now in progress will be published soon, with the names of our laboratory assistants (Chidester, Bourne and Wiles).

For a long time it has been known that while Vitamin E is essential for reproduction, it is no more so than Vitamin A. Evans and Burr (1925) have stressed the fact that Vitamin E is concentrated in the seeds and embryos of certain plants as well as in egg yolk. The fact that in experimental studies that we are now carrying on, we have noted gonadal development in animals thoroughly depleted of Vitamin A and then furnished linoleic acid and extremely small quantities of ferrous iodide is, we believe, rather significant. Schmidt (1891) and also Miller (1910) and Ivanow (1912) have shown that the *iodin* numbers of the *unsaturated acids* and oils of various seeds decrease during germination. Numerous investigators have demonstrated that either an excess of iodin or an excess of fat will induce sterility in experimental animals. We contend that iodin-fat imbalance is a most fundamental one in deficiencies in fat soluble Vitamins A and E.

F. E. CHIDESTER

## THE FEEDING HABITS OF THE FIRST INSTAR LARVAE OF THE CLUSTER FLY

FIRST instar larvae of the cluster fly, *Pollenia rudis* (Fab.), have been observed in the laboratory feeding upon the earthworm *Allolobophora caliginosa* (Sav.). Former records indicate only *Allolobophora chlorotica* (Sav.) and *Eisenia rosea* (Sav.) as hosts to this parasite.

Former investigators have not observed the entrance of the first instar larvae into the body of the earthworm. Keilin (1915) suggested that the larvae probably enter by means of the genital pores while the worms are in copula.

First instar larvae have now been observed by the author to enter directly through the cuticula. They have been observed in various stages of entrance, from the time when only the mouth parts were imbedded in the cuticula until only the posterior spiracles were exposed. First instar larvae apparently always feed with the spiracles exposed.

As many as five larvae have been observed feeding on one worm. They usually enter the anterior portion of the worm in the region from the tenth segment to a few segments posterior to the clitellum. All the larvae so far observed have entered the worm from the dorsal side. While the usual place of entrance seems to be the intersegmental furrows, the larvae have been observed entering through the thicker portions of a segment and also through the clitellum.

The earthworms were placed in a petri dish containing usually about thirty eggs of the dipterous parasite. The worms were introduced as the larvae began to emerge from the eggs. Parasitism usually occurred about two days later.

Mrs. Grace Pickford Hutchinson, of Osborn Zoological Laboratory, Yale University, very kindly identified the earthworms as *A. caliginosa* (Sav.).

R. M. DECOURSEY

DEPARTMENT OF ZOOLOGY,
CONNECTICUT AGRICULTURAL COLLEGE

## BRANCHINECTA COLORADENSIS IN COLORADO

IN the February 27 and September 11, 1931, issues of SCIENCE there was a discussion as to means of dispersal of the fairy shrimp, *Branchinecta coloradensis.* In the latter article it is also recorded from a hollow in a boulder at the elevation of 8,000 feet near Estes Park. In Ward and Whipple it is recorded as an alpine species. Dodds, in his "A Key to the Entomostraca of Colorado," gives its distribution as alpine, but with one record from St. Vrain at an elevation of 5,100 feet.

My own experience shows that it is not nearly so strictly alpine as has been supposed. I have collected